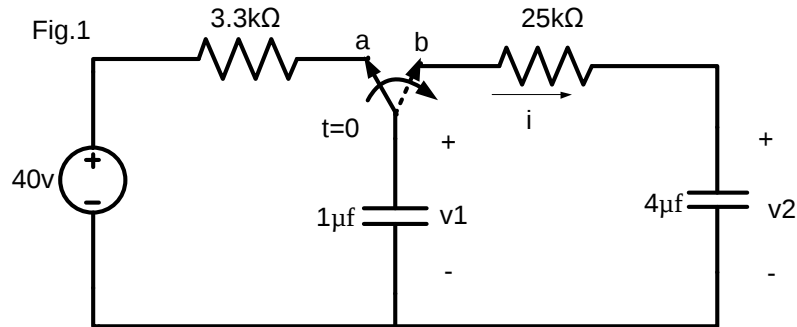


Electrical Circuits (2)

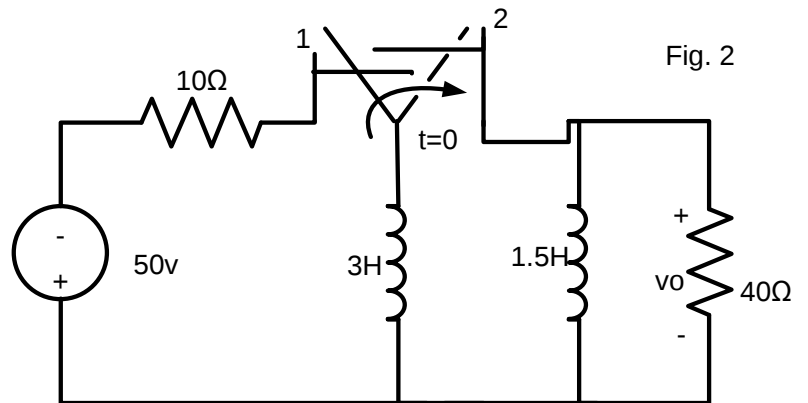
Sheet 3 - Sequential Switching

1- The switch in the circuit in Fig. 1 has been in position (a) for a long time and $v_2 = 0\text{ V}$. At $t = 0$, the switch is thrown to position b. Calculate:

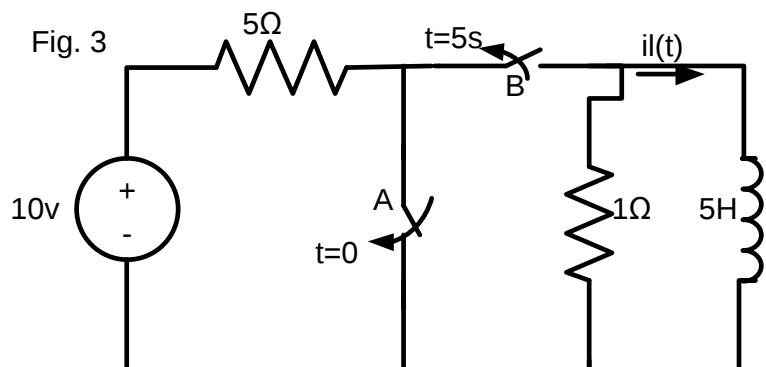
- i , v_1 and v_2 for $t \geq 0^+$
- The energy stored in the capacitor at $t = 0$.
- The energy trapped in the circuit and the total energy dissipated in the $25\text{ k}\Omega$ resistor if the switch remains in position b indefinitely.



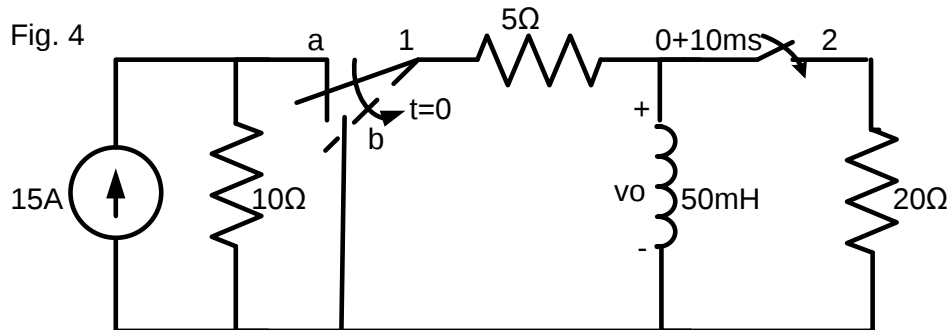
2- The switch in the circuit in Fig. 2 has been in position (1) for a long time. At $t = 0$ it moves instantaneously to position (2). How many milliseconds after the switch operate does v_o equal 100 V ?



3- In the circuit in Fig. 3, switch (A) has been open and switch (B) has been closed for a long time. At $t = 0$, switch (A) closes. Five seconds after switch (A) closes, switch (B) opens. Find $i_l(t)$ for $t \geq 0$.



4- The action of the two switches in the circuit seen in Fig. 4 is as follows. For $t < 0$, switch 1 is in position (a) and switch 2 is open. This state has existed for a long time. At $t = 0$, switch 1 moves instantaneously from position a to position b, while switch 2 remains open. Ten milliseconds after switch 1 operates, switch 2 closes, remains closed for 10 ms and then opens. Find $v_o(t)$ 25 ms after switch 1 moves to position (b).



5- There is no energy stored in the capacitor in the circuit in Fig. 5 when switch 1 closes at $t = 0$. Ten microseconds later, switch 2 closes. Find $v_o(t)$ for $t \geq 0$.

